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JPRS Report

Nuclear Developments

Nuclear Developments

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SOUTH AFRICA

Uranium Swaps Reportedly Beat U.S. Sanctions

51000012a Johannesburg *BUSINESS DAY* in English
19 Feb 88 p 5

[Text] Brussels—The EC could not prevent companies from swapping consignments of uranium to beat a US embargo on imports of the mineral from SA, an EC official said yesterday.

European Atomic Energy Community (Euratom) Supply Agency director Georg von Klitzing was commenting on a report in the West German magazine *DER SPIEGEL* about so-called "flagswaps" which masked the origin of the uranium.

He said Euratom did authorise swaps of nuclear material, but it was common practice and did not break agreements with major supplier countries governing the final use of the uranium.

"Under the (Euratom) treaty and its statutes, it would be difficult for Euratom to say no for political reasons to such a contrant," [quote as published] he said.

The US ban on imports of SA uranium is one of Washington's sanctions against Pretoria. The EC does not have a similar embargo.

Euratom was set up in 1958 along with the EC to promote the peaceful use of nuclear energy and has a monopoly on the acquisition of fissile materials in the EC.

Between mining uranium and its use in a nuclear reactor, the raw material, known as yellow cake, has to be converted and enriched and is then used to make fuel elements. All these operations take place at different locations.

Von Klitzing said swaps helped companies meet fluctuations in demand since their supplies were usually tied to long-term contracts. It also cut down transport of the mineral and therefore reduced safety risks.

In a typical swap, a US company which bought SA uranium and sent it for processing to Europe might choose to swap ownership with an EC company which had bought Australian uranium to be processed in the US. "Such swaps would only be done for commercial reasons and not to circumvent any embargo," Von Klitzing said.

A spokesman for the Australian Embassy in Brussels said his government was checking the *SPIEGEL* report. All Australian exports of uranium were subject to strict conditions about the final user.

AEC's Prima To Be Privatized

51000012b Cape Town *DIE ARGUS* in English
16 Feb 88 p 13

[Article by Roy Cokayne]

[Text] Pretoria—A high precision facility that manufactures the separating elements for uranium enrichment plants is to be the first group within the Atomic Energy Corporation (AEC), to be privatised.

It is presently being run as a separate business, known as Prima, within the AEC. Prima has a staff of about 500 people and the Industrial Development Corporation has been involved in its management for about a year.

Although Prima's main client is still the AEC, sufficient market penetration has already been achieved to ensure that the Corporation's share of its turnover will be reduced substantially in the near future.

A statement by the AEC says a decision has already been taken to enter the "second phase" of Prima's privatisation. It said negotiations were being conducted with the private sector on the appointment of a board of directors and a chairman for the new company.

Negotiations with financial institutions regarding financing of the envisaged company had also reached an advanced stage, it said.

"The unique skills and technology are vested in the group's employees and not in machines, buildings or equipment. The success of the venture is therefore mainly dependent on the retention of staff and their willingness and support. The AEC cannot afford to lose these skills and technology, which were established at high cost.

"The AEC will therefore enter into negotiations with the employees to establish reasonable and mutually acceptable terms and conditions for their transfer to the privatised company," the statement said.

The AEC has conducted a programme of rationalisation and restructuring of its activities based on a business-orientated approach during the past two years. It involved the strict evaluation of priorities, the improvement of financial discipline and effective management—and is nearly complete.

Certain activities have also been identified which could be privatised to the benefit of both the AEC and the South African industry.

Building of Second Nuclear Station Postponed
51000012c Johannesburg *THE CITIZEN in English*
5 Feb 88 p 9

[Text] Eskom has quashed speculation that the building of a second nuclear power station was being considered in the near future.

Responding to possible nuclear sites in Natal, Eskom pro Mr Ewald Thal, said: "It is impossible that a new power station will come into operation before the end of the century."

Eskom had an ongoing programme to identify possible nuclear sites for the establishment of a nuclear power station in 19 areas along South Africa's coastline, but it was a long term project.

"There is no indication that we are building a power station or that we will build any particular area," Mr Thal said.

The fact that Eskom was looking at possible sites did not mean that a new nuclear power station would be built.

"It is highly unlikely that we will build before the next century," Mr Thal said.

"It is not a high priority programme."

Such speculation was "way out of line," he said.

Loeberg nuclear power station produces 1,800 megawatts—eight percent of the country's power.

Mr Thal said the country would need another nuclear power station some time in the future, once its coal supplies had run out, but it was impossible that it would come into operation before the end of the century.

/9274

JAPAN

Power Firms Sign Nuclear Research Pact
51600018 Tokyo KYODO in English
0907 GMT 24 Mar 88

[Text] Tokyo, 24 Mar (KYODO)—A research institute of 11 major Japanese power firms Thursday contracted with a European research body to jointly study and develop the transmuting of transuranium elements having longer half-life in nuclear power plants' high-level nuclear wastes.

The Central Research Institute of the Electric Power Industry (CRIEPI) said that under the agreement with the Commission of European Communities Joint Research Center, Karlsruhe European Institute for Transuranium Elements, they will spend some 300 million yen over the next four years in assessing whether such uranium can really be used as metal fuel.

If realized, the safety of nuclear waste disposals will be immensely enhanced, officials said.

The European institute is based in Karlsruhe, West Germany, they said.

The plan calls for the first breeder reactor to transmute these transuranium elements, including neptunium and americium, through nuclear fission into elements having a much shorter half-life as metal fuel such as cesium and strontium, they said.

They said that currently plans are under way to dispose of high-level nuclear wastes by burying them underground after classification.

They explained that one kilogram of transuranium elements occurs per ton of spent nuclear fuel, taking hundreds of thousands of years to reduce in radioactivity.

/9274

ROMANIA

Cernavoda Nuclear Power Plant Construction Discussed

Bucharest FLACARA in Romanian 19 Feb 88 pp 1, 2

[Constantin Ismaileanu article: "Cernavoda in a New Era"]

[Text] On December 1st 1878, among other passengers disembarking from the liner Sophia was the poet Alexandru Macedonski, the author of "Nights," who was coming to take over as prefect of the county, which had its seat in... Rasova! (a nearby commune). As a matter of fact, the poet was returning from a quasi-exile, to which he had been exposed by his antimonarchy poems and pamphlets.

The locality did not make a very inspiring impression on the 24-year-old man: it was a tiny, dusty one-horse town with a few insignificant houses and insalubrious stores, the ubiquitous water casks (a paradox: although located on the Danube, Cernavoda for a long time suffered water shortages), a market, and that was about it!

Toward the end of the century the town became somewhat livelier due to the construction of the Anghel Saligny bridge and of the "Ideal," a small cement factory that for years remained the only local industry.

The cement that was made there was of good quality, but the cost price was very high, so that naturally, it had to close down.

Because of the advanced average age of the population, Cernavoda, the "town where nothing ever happened," was also dubbed "retiree city," a suggestive name for its socioeconomic dynamics.

The new administrative-territorial organization of the country—which marked its 20th anniversary on February 15th 1988—was a first resolute step toward the destiny to which the RCP summoned Cernavoda, like many other till then insignificant localities of the country.

However, the town's new development and the unprecedented changes in its history were brought about by the implementation of the impressive projects of the Ceausescu Era: the Danube-Black Sea Canal, the new road and railway bridge over the Danube, and the nuclear power plant.

The residents of Cernavoda use the future tense extensively in their speech: this road will be part of the North-South Trans-European Highway; here, in this torn-down area, we will lay a 6-7 meter loess foundation on which we will build the new city center; here we will build a hospital, and next to it a new cultural club and a

power engineering high school to train the cadres necessary for the power plant; this year we will build 400 apartments, and will erect a monument to the builders. All future oriented!

This is a future of socialist certitude, and for modern Romania Cernavoda constitutes one of the most telling expressions of the clear-sighted and judicious policy that governs the fatherland's construction.

Cernavoda is a town that we build today with an eye to the year 2000.

The Power Plant

The impact of the construction of the first nuclear power plant on the town is overwhelming. This is felt as soon as one arrives at the train station, the quiet train station of Cernavoda, guarded by the bronze soldier at the end of the Anghel Saligny bridge, where until recently not more than two-three passengers used to detrain, but which is now practically mobbed, particularly on Mondays and Saturdays, when the commuters come and leave. Behind the train station there is always a spacious bus waiting; there is nothing written on it, but everyone knows that it goes to the power plant. The ride is free.

However, the commuters make up only a small percentage of the thousands of workers, technicians, engineers, and specialists in various areas, especially of the specialists, who came here to achieve a pioneering technological project unprecedented in the power plants industry of Romania.

The Cernavoda nuclear power plant is beyond comparison with any other existing project from the viewpoint of investment volume, technical complexity, and economic importance. Comrade Valeriu Popa, deputy minister of electrical power told us, a minister dressed in overalls, whom one can meet every single day at the busiest spots of the vast building site.

It constitutes a "top priority" for the entire Romanian economy because, aside from the cooperation with Canadian, U.S., Italian, and Indian partners, many other Romanian industrial units and research and design institutes, as well as our entire industry with its peak branches, contribute enormous quantities of parts, installations, subassemblies, and original engineering solutions. Trying to enumerate them from memory runs the risk of omitting someone; nevertheless, here are a few of our "major" industrial manufacturers that currently produce for Cernavoda: The siderurgical concerns of Galati, Hunedoara, and Tirgoviste; metallurgical enterprises in Buzau, Roman, and Cimpia Turzii; I.M.G.B., Republica, Vulcan, Independenta of Sibiu, I.U.C.-Ploiesti, the Timisoara Metallurgical Enterprise, Automatica, Electroputere, Electronica, the Bucharest Machine-Tool and Aggregate Enterprise, the Bucharest Heavy Engines Enterprise, the Computer Enterprise, the aircraft enterprises of Bucharest and Brasov, many chemical plants,

research institutes coordinated by the National Council of Science and Technology, and other specialized enterprises in Constanta, Drobeta-Turnu Severin, Ploiesti, Iasi, Timisoara, Cluj-Napoca, and many others.

The entire country, it would seem, is now "represented" in Cernavoda by its best—no compromise on quality—and most efficient products, guaranteed for at least 30 years, on a par and even exceeding the international state of the art.

It will not come as a novelty to our readers that many technological "firsts" in the area of construction and assembly were achieved on or for this building site, where many teams of technicians put to test their professional competence and capabilities.

What we do want to stress, however, is that the construction of the first Romanian nuclear power plant has a particularly favorable impact on the industry as a whole, because it impels it to raise its level of competitiveness and technological capability. We will content ourselves with just one recent example in support of that statement, provided by Comrade Dragos Gabor, one of the veterans of this building site and the director of the nuclear power plant, in other words, the customer in this project.

The reinforced concrete elements of the plant required an insulating material for the joints, which, as builders know, are never quite perfectly tight. This was a special, particularly resistant material, capable of withstanding radiation, too. The material is called Tiocol and it is a very expensive and very, very difficult to procure import.

Was that an insurmountable obstacle? Not at all! The Romanians went to work and soon the Bucharest research center for lacquers, paints, and anti-corrosives completed the necessary research and the chemical enterprise of Rimnicu Vilcea produced the finished material. Only a few days ago, Comrade Gabor told us with undisguised pride, the Canadian experts concluded that the Romanian product was better than theirs, and recommended it for the international market!

In Cernavoda, the scientific-technical revolution is a daily implemented concept.

The Nuclear Power Plant Workers

The five reactors—or power groups, as the experts refer to them—will produce 3,500 megawatts per hour of electrical power. The decision fell in favor of this Candu-type power plant (similar to plants already in use in Canada, Argentina, and South Korea), because it permits the utilization of nuclear fuel that is produced in our country, so that we do not have to depend on imports for raw material.

Naturally, this means that a source of valuable raw material, found in our country and unutilized in the past, will now be put into production with great economic efficiency. This will be carried out by the future nuclear power plant workers of Cernavoda.

For any specialist, and especially for a young specialist, the Cernavoda nuclear power plant represents, or can represent the fulfillment of a professional ideal, told us the young engineer Marian Serban, a 1983 graduate (and best of his class) of the Magurele Physics Institute. "I came here with my wife, who teaches mathematics at the Cernavoda lyceum, and we intend to stay, because Cernavoda is a dynamic town, a young town with young people."

The degree of automation of the plant, said engineer Sergiu Molin, director of the nuclear assembly enterprise, can be compared perhaps only with that of a ultramodern supersonic airplane. It will utilize on-line computer control, with the aid of a computer that does not merely furnish data, but is directly involved in the production phases and issues decisions. Similarly, a sophisticated robot will load and unload the fuel on the reactor, and the safety of the workers will be outside of any danger because of the utilization of remote [control] techniques and perfect insulation.

In point of fact, all the specialists we talked to emphasized that at this power plant, no accidental occurrence can have the effects of a nuclear disaster on people or on the environment.

During visits to the building site, from the very first stages of construction, RCP Secretary General Comrade Nicolae Ceausescu firmly requested the builders and assemblers to take all the necessary measures and to observe without exception all the safety standards required to ensure complete safety in the utilization of this nuclear power plant.

Who are the future nuclear power plant workers (it has still not been agreed here whether they should be called atomists or nuclearists...)?

Although there is still a lot of work to be done before the hour of the "first parallel," we have already begun to recruit and train people who, like the astronauts, will be working in a brand new field and will have a unique chance for professional fulfillment. Naturally, the candidates have to pass rather difficult professional tests, psychological tests, etc. Last year, for example, out of 2,000 applicants only 200 were recruited, that is to say, 10 percent. However, it is worth trying, because being one of the pioneers in this new field of Romanian power engineering is, I believe, a major source of satisfaction and the fulfillment of a work and life ideal for any young Romanian engineer, attracted by the miracle of the new and the desire to do something special in his profession.

The Future

As is only fit and proper, the young town has a young mayor.

I had met Nicolae Butoi a few years ago, when he was the head of the national youth building site of the Midia-Navodari petrochemical combine. Later I met him again in his new capacity of party organizer of the nuclear power plant project.

For over 1 year Nicolae Butoi has been the mayor of this town that is being rebuilt almost from scratch. That is precisely why during the day it looks like a building site itself. New avenues, streets, and roads are mapped out, the old part of town, near the Danube, is being torn down, and important urbanistic projects are going up.

"Within a very short period of time we have built 4,000 apartments and commercial and service facilities. Those who will come to work at the Cernavoda plant have a right to find here all the urban conditions and requirements expected for a civilized and comfortable life: apartments, schools and kindergartens, a modern hospital, cultural clubs, sports facilities, many parks (alone this year we will plant over 4 million flowers), and even a swimming pool.

"These are the areas on which we are focusing our efforts at the present, with a view to ensuring a high living standard—the supreme goal of our party's policy."

Under the ancient symbol of the Hamangia Thinker, whose eyes were scanning the future, and under the contemporary symbol of the atom used for peaceful purposes and for humanity, Cernavoda is becoming yet another proud citadel of modern Romania.

i2782

ARGENTINA

Authorities Confirm Heavy Water Spill *PY211617 Buenos Aires TELAM in Spanish 1157 GMT 21 Apr 88*

[Text] Buenos Aires, 21 Apr (TELAM)—Eduardo Cohen, national director of Energy Programming and Energy Policy, has confirmed that in December 1987 there was an accident which caused a spill of 50 tons of heavy water within the Atucha Nuclear Plant. However, he asserted there was no nuclear threat because the heavy water was not contaminated since it had not yet been processed inside the reactor.

Cohen explained that the Atucha Nuclear Plant stopped operating in August 1987 for a scheduled maintenance program and it was scheduled to resume operating on 23 December 1987.

He added that due to an accident, the cause of which is included in a report that he did not have at hand but which was investigated by the CNEA, there was a spill of 50 tons of heavy water. In view of this, a study was conducted at the nuclear plant into the possibility of reincorporating the water into the system. Therefore, instead of becoming operational in December as scheduled, the Atucha Nuclear Plant experienced a delay and it began operating on 20 April.

Cohen said this spill did not cause any danger because the heavy water was not contaminated since at the time of the accident the water was being pumped into the reactor; that is, it had not been processed inside the reactor. It was merely being pumped into the cooling system.

In a statement to Radio Rivadavia, Cohen asserted that while on this occasion there was no danger of contamination whatsoever, when this kind of accident occurs and heavy water comes into contact with other surfaces, there is the possibility of contamination. He said that while there was a spill, there was no nuclear threat.

Heavy water, also known as deuterium oxide, is a component similar to the water used as a moderator of neutrons in nuclear reactors.

Embalse Nuclear Plant Closed for Repair *PY161558 Buenos Aires TELAM in Spanish 1932 GMT 15 Apr 88*

[Excerpt] Cordoba, 15 Apr (TELAM)—The Embalse nuclear plant has been shut down to resolve a problem in the pump system. This was reported at noon today by Hector Diaz, the plant's director, who estimated the problem will be fixed sometime next week.

Diaz said that a solution to the problem is being sought, and he termed the problem serious. He also said that the problem emerged after 9 months of uninterrupted functioning during which the plant provided energy to the national system at 100 percent of its capacity.

He told local station Radio LV3 that the national energy problem is due to a shortage of energy from several plants, including hydroelectrical plants. He stated that currently the Salto Grande Dam does not have any water, and that the Chocon plant had to release a large amount of water due to a problem in the dam itself, thus preventing it from providing a large amount of energy.

He added that there are also thermal plants that are having problems, such as a lack of fuel. During the past few months the Embalse plant has done everything to help in resolving these problems. Unfortunately, we now have to carry out a series of unpostponable technical tasks, he added.

Nuclear Projects Threatened by Indefinite Delays *51002019a Buenos Aires CLARIN in Spanish 28 Feb 88 pp 4-5*

[Article by Eleonora Gosman: "Threat of Shutdown on Projects"]

[Text] Atucha II, Argentina's third nuclear power plant, will this year cross the threshold of a decision as to whether it will start up in 1993 or be indefinitely postponed. If the latter option prevails, and all indications are that it will, the critical mass of the nuclear plan will fall apart and with it the industry that revolves around these projects.

At this juncture, the die has been practically cast for the National Commission for Atomic Energy (CNEA). The overall budget assigned to it by the Finance Secretariat for 1988 stands at \$780 million, some \$376 million of which must be apportioned among the various projects of the program, among them the power plant under construction and the industrial heavy water plant, which together will account for 60 percent of the amount.

Although the commission has not concluded the fund apportionment process, its authorities admit that the investments will be insufficient to guarantee that Atucha II can be completed on schedule.

The shadow of a delay is thus hanging over this project, which was originally supposed to be completed in July 1987 and whose timetable has already undergone changes on two previous occasions. Two factors will contribute to the delay this time. Given the budget it has been assigned, which in constant values is around the same as in 1987, the commission can hardly plan for a step-up in the pace of work at the project. We must remember that last year it did not exceed a weak two percent.

Moreover, though, the payment conditions prevailing for local contractors are also having an effect. The prospects of financing future work partly with bonds will push up bids in the new contracts and, consequently, reduce the yield of the allocated funding.

Troublesome Financing

Business sources have estimated that in order to complete the plant in 1993, which is the scheduling change that the new leadership of the CNEA made shortly after taking over, \$160 million would have to be spent on local supplies and services in 1988. They also estimated that only half of that requirement would come from the Finance Secretariat.

The commission is working with similar guidelines. It admits that the financing that the Treasury can provide will suffice at most to maintain the pace of the work under way, without giving any thought to new contracts. They indicate, consequently, that the only way to change the outlook is to resort to domestic or foreign loans from the financial system. Without such required funding, they feel that Atucha II will enter "a state of hibernation" for the next 2 or 3 years.

The efforts that Dr Ema Perez Ferreira undertook with Secretary Mario Brodersohn 2 weeks ago point in this direction. She asked for a larger budget, which would enable her to make use of the loans that the CNEA could obtain, should the need arise. According to the chairwoman of the commission, the secretary promised her that "a way will be found so that if fresh money is obtained, it can be used for the projects."

Last year the private sector offered to negotiate with international banks for access to "on lending" loans available to Argentina. But the Finance Secretariat rejected this offer outright because of the "perverse" effect of such loans on some economic variables. Other forms of financing were thus sought, including requests to FRG institutions, but the conditions offered on the market "are unacceptable," the CNEA is asserting.

Costs and Delays

Under the initial plan, Atucha II was supposed to be built in 7 years. Construction of the industrial heavy water plant was scheduled in connection with the timetable for this power plant, as the former was supposed to begin producing the input used as a cooler and moderator a year before the third power plant was completed. But the inadequate funding noted from the beginning delayed both undertakings. The appropriated budgetary funding has not exceeded, on the average, 60 percent of the initial requirement for each fiscal year. This restriction severely affected credit in local currency, inasmuch as 85 percent of the funding in foreign currency comes from outside financing.

Both the power plant and the heavy water plant were brought to a virtual standstill in 1984 and 1985 by delays in funding and in the passage of the national budget. This development was not without impact. Not only did it harm the Argentine nuclear industry but also gave rise to considerable unproductive spending and forced 1986 funds to be allocated for contract renegotiation. As a result, the project moved ahead by just three percent. The story was repeated again last year.

If the power plant were to go on line in June 1993 after 13 1/2 years under construction, its cost would be up 290 percent. But under these circumstances all indications are that there will be a much longer delay. In the hypothetical case of a 2- or 3-year delay, the power plant would cost 345 percent of the original estimate. This seems to be the chronic disease of Argentine public works.

8743

Update on Planned Gastre Nuclear Dump 51002019d Buenos Aires CLARIN in Spanish 1 Mar 88 p 37

[Article by Eleonora Gosman: "The Gastre Nuclear Repository"]

[Text] A group of scientists is investigating the possibility of building a nuclear "dump" 60 kilometers from Gastre, a village of 300 inhabitants in Chubut Province. The project is in the feasibility study stage for now. According to the initial findings, the site that has been selected, a rocky massif in the Sierra del Medio, would be suitable for storing radioactive waste.

Gastre is one of those tiny enclaves on the Patagonian tableland in which no more than a few hundred residents live. Although its name appears on the map, in Chubut Province some 200 kilometers from Esquel, it would not ring much of a bell if the National Commission for Atomic Energy (CNEA) were not planning to build a nuclear waste repository or "dump" in the area.

The project is in its preliminary stage for now. For the past 8 years a group of scientists has been studying the characteristics of a rocky massif located in the Sierra del Medio some 60 kilometers from Gastre. The site apparently offers the best conditions for storing the highly radioactive wastes that nuclear power plants produce when they burn fuel.

Researchers feel that the storage of these wastes will be a serious problem next century. For the time being, the rods with the burnt fuel that leave the two power plants in operation, Atucha I and Embalse, are kept isolated in tanks, one of them located in the Cordoba town and another two in Ezeiza. But they can remain under those conditions for no more than 30 to 35 years.

They will then have to be assigned a permanent resting place. According to Norberto Ciallella, the head of the repository project, there are two possible alternatives. The first is to reprocess the fuel element to obtain plutonium, which is produced by irradiating uranium, once it has been stored for 10 years in the tanks. This amount of time must pass so that its heat level declines enough. The second alternative is to store the fuel element in the same way, but without extracting the plutonium. In Ciallella's judgment, this option is the least beneficial because plutonium is regarded as a strategic energy reserve. Early next century it will be used in fast breeder reactors, which will generate energy and, at the same time, produce more fuel.

Choice

At present a dozen countries are investigating methods of eliminating radioactive waste. Argentina is one of the five nations that have the most advanced projects. Sweden, France, Switzerland and the United States are the other four.

The basic objective of these repositories is to keep the wastes isolated from the biosphere for as long as it takes for their radioactivity to decline sufficiently. The commission says that the Sierra del Medio massif meets all of the requirements for storage. For 100,000 years the granitic rock will zealously protect the 3,000 containers in which the waste will be stored. Estimates are that this peculiar facility has the capacity to store the reprocessed fuels produced by 6 atomic power plants over a 30-year period.

After this period, the radionuclides would begin to seep into the biosphere, transported by the surrounding water. But by that time the doses that the local population would receive would be so small that they would be equivalent to the radiation that they receive in a half day of exposure to the sun.

Prior to its storage in the rocky massif 500 meters underground, the radioactive waste must be placed in a vitreous matrix inside stainless steel receptacles. They will then be enclosed within a 10-centimeter thick lead wall lined on the outside with a metal sheet to prevent corrosion. With this arrangement alone, the waste could remain in the open for 1,000 years without causing any sort of contamination. The receptacles will be able to withstand a fall from 9 meters onto a hard surface and a fire that exposes them to a temperature of 800 C for a half-hour without releasing any radioactivity into the environment. These are the safety requirements imposed by the International Atomic Energy Agency.

Debate

To judge by the report of the technicians, the feasibility study under way provides for any potential catastrophe. Thus, in choosing the site, they are considering both the

seismicity of the spot (which on the established scale is zero, in other words, the same as the city of Buenos Aires) and the unlikely fall of a meteorite.

Nonetheless, the project has not escaped criticism. It has been claimed that the dump will be used by third countries, a rumor that the CNEA makes it a point to deny. The researchers told Miguel Monserrat, an Intransigent, and Cesar MacCarthy, a Peronist, two national deputies who explored the spot last weekend, that only the waste produced by Argentine power plants would be stored at Gastre. There is presumably no reason to believe that the intentions are otherwise. In any event, the commission seems prepared not to shun debate, and that is a good sign.

8743

Boix Amat on Consequences of Budget Cuts

5100261W Buenos Aires CLARIN in Spanish
28 Feb 88 pp 6-7

[Interview with Raul Boix Amat, the director of the Shop Committee of the Argentine Association of Nuclear Technology, date and place not indicated; first paragraph is introduction]

[Text] In an interview with CLARIN, Raul Boix Amat talked about the consequences for the nuclear projects under way of the budget cutbacks faced by the National Commission for Atomic Energy (CNEA). Boix Amat is the director of the Shop Committee of the Argentine Association of Nuclear Technology and manager of nuclear projects for Techint S.A., one of the main firms in the Coca II consortium, which is in charge of construction at Atucha II and is also involved in building the heavy water plant.

[Question] How much has the CNEA's budget been cut and how will this affect the industry?

[Answer] So far this decade, the budget of the CNEA has shrunk by almost 70 percent in constant values.

The shrinkage is even greater in real terms due to the financial costs prompted by the displacement of the flow of funds and to the discounting of bonds.

Consequently, and because current spending cannot be cut as much, the country's investment in the nuclear sector, which is essentially government investment, has fallen even more sharply, thus reducing the demand for goods and services that the specialized industry meets.

The contraction of demand has been even more acute for private local businessmen because, on the one hand, to preserve their manpower the CNEA and its enterprises began borrowing money that traditionally went to the private sector, and, on the other, because the absence of local sources of financing encouraged the importation of goods and services financed from abroad.

I feel that the demand for nuclear goods and services from local businessmen has shrunk by more than 80 percent so far this decade. Consequently, the industry has suffered such a setback that we could assert, and this is no euphemism, that the country's nuclear industrialization program, which was conceived late last decade, has turned out to be a deindustrialization program instead.

There is no time left to begin rebuilding and consolidating an industry that will unquestionably be of vital importance to the country in the next century.

[Question] How do you see the future of the major CNEA projects that are under way?

[Answer] The Atucha II Nuclear Power Plant and the Industrial Heavy Water Plant are the most ambitious industrial projects that the CNEA is currently involved in.

The former is an estimated 40 to 50 percent completed, and the latter about 90 percent.

Owing to budgetary vicissitudes, the cost of building just half of Atucha II has already exceeded the total initially budgeted for the entire project, so if things continue this way, the power plant will have cost more than twice as much as planned when it is completed. My point in saying this is that to continue the project, sweeping changes will have to be made in the manner of contracting and financing. If they can be made, the remaining investment should not top \$750 million, and since today there is no other way to install the electricity output of Atucha II in the country for this amount of money, I think that such changes must be made and the project then completed.

As for the industrial heavy water plant, I do not foresee difficulties in completing it, because less investment is required for this purpose than to finish Atucha II.

Regarding Atucha II, I feel that until a comprehensive solution is implemented for its completion, we should move forward only in engineering, the manufacture of critical components and construction works that do not entail unproductive efforts; we should keep moving ahead with both construction and with payments and agree to the current expenditures that this project can currently tolerate.

[Question] Will local businessmen accept payments in bonds?

[Answer] Local businessmen have had no choice but to accept one-quarter payment in cash and the rest in bonds for the matured debt. As long as the government honors these bonds, they may also be accepted, in a more equitable proportion, for future contracts. The proportion has to change because owing to the absence of local financing, industrialists cannot finance the direct cost of

these contracts. As for the new contracts, the discounting of these documents will obviously be passed on to prices, therefore, in practice this form of payment will have the effect of further shrinking the CNEA budget.

8743

CNEA Chairwoman on Financial Constraints, Possibilities

5/10/20/96 Buenos Aires CLARIN in Spanish
28 Feb 88 pp 6-7

[Interview with the chairwoman of the National Commission for Atomic Energy (CNEA), Emma Perez Ferreira, date and place not given]

[Text] In her talk with CLARIN Emma Perez Ferreira, the chairwoman of the CNEA, answered the following questions about the future of the Argentine nuclear program.

[Question] What is your budget?

[Answer] It is the same, in constant values, as in 1987, but without the cutbacks that we voluntarily agreed to in August of last year, under the agreement that we made at the time with the Finance Secretariat. The draft that we have submitted calls for 1,749 billion australes. About 843 million is for the various projects and will be drawn one-quarter in cash and the three-quarters in bonds. This has forced us to reconsider, along with Energy Secretariat officials, the probable start-up date of Atucha II, inasmuch as it will be hard to comply with the established timetable under this budget. Influencing this are the results of the renegotiated contracts with local suppliers of the project and the prospects that they hold out for entering into new contracts to continue the project at the necessary pace.

[Question] And is this reason that the renegotiated contracts entail higher costs at the project and, consequently, less funding to enter into the new contracts?

[Answer] After lengthy discussions the contractors accepted the bonds without touching prices, even though payment conditions were changed on them. An accord was difficult, first because the change in payment conditions is not provided for in the public works law, second, because the debt that has fallen due is very large and the value of the bonds could cause losses. Thus, they initially demanded a discount of the CNEA bonds of about 50 percent. But in the face of the threatened shutdown of the project, they decided to close the deal and accepted our offer, which applied both to the matured debt and to the work to be done in the future under the existing contracts. The accord called for the bond to be issued 45 days before the payment date. The resulting financial compensation of 10 to 14 percent was backed by the Finance Secretariat. Thus, the CNEA avoided rescinding contracts and calling for bids again, which would have caused prices to skyrocket.

[Question] These accords have to do with the contracts in place. But what is going on with the new contracts to be entered into from now on?

[Answer] We are trying to sound out the attitude of the companies by asking for bids for new work in bonds and in cash, and on this basis we will make decisions. Of course we expect higher prices, and this is what is leading us to think about a potential delay in starting up the project. The possibilities of continuing it include a longer delay than the one provided for after last year's negotiations. We thought that the process would conclude in September at the latest and that in the last quarter we would be able to pick up the pace of work, but that was not the case. We are also taking into account the expected increase in prices under the new contracts. We believe that unless a bigger push is given through a loan that provides a less costly alternative for the contractor, we won't be able to complete the project by 1993.

[Question] So there is no plan yet to continue working this year.

[Answer] We are trying to come up with a more rational way of using time during the first 4 months of the year, so that we are in a position to call for bids on the new contracts in the most appropriate manner. The existing renegotiated contracts called for key dates so that we can make choices about proceeding more briskly or more slowly. In other words, we have provided for two possibilities.

In the case of the construction work at Atucha II, we secured more favorable financing from our German partner, who obtained a loan from his country for his part of the local project. This financing accounts for 38 percent of the investment. This has provided relief for the building consortium.

[Question] Have you already looked into the possibility of obtaining loans that would enable you to expand your budget allocation?

[Answer] We hope to come up with such financing, but our search is very preliminary.

[Question] When do you expect to have something definite?

[Answer] In order not to lose the chance of reaching the 1993 goal, we will have to have clear prospects by the end of the first third of this year. As far as budgetary funding is concerned, it ought to be decided on right now.

[Box, p 6]

Nonpayment Problems

"The main problem plaguing the project timetable is nonpayment to the companies that are supplying domestic components," CLARIN was told by Erhard Gaedtke, the general representative of Kraftwerk Union (KWU). KWU is the subsidiary of the Siemens group that has a 25-percent share in the Argentine Nuclear Enterprise for Electrical Power Plants (ENACE), the joint enterprise that is in charge of building Atucha II. The remaining 75 percent belongs to the National Commission for Atomic Energy. In all, Gaedtke added, the CNEA owes our company about \$60 million, which has already come due, but the main problem is with ENACE.

Under the new timetable the project is scheduled to be completed by 1993, as long as the CNEA has the budget it needs to meet its commitments to domestic contractors. In actuality, Gaedtke adds, the debt to KWU is on a different track, since German banks have provided long-range financing for the project.

The budget drafted by the CNEA to complete the project is around 2,000 million. In 1988 alone it needs around \$160 million to pay off the project certificates for domestic components.

So far about 60 percent of the total project budget has been spent, and halting it today would be catastrophic.

Fresh loans from Germany are not in the offing at present. The only possibility is an increase to 165 million marks to import components that domestic firms manufacture, and because of the "buy domestic" campaign this is unthinkable.

8743

BRAZIL

Pires Defends Existence of Bomb as Instrument of Peace

51002018b Rio de Janeiro O GLOBO in Portuguese
9 Mar 88 p 5

[Text] Brasilia—The existence of the atomic bomb as an instrument of peace was defended by Minister of the Army Leonidas Pires Goncalves when he met 2 weeks ago with Congressman Fabio Feldman (PMDB-SP), an ecology activist. According to army spokesman Gen Carlos Olavo Guimaraes, Pires was speaking in purely theoretical terms. At no time did he mention the possibility that a Brazilian atomic bomb might be built.

"Our policy continues unchanged: Atomic energy is to be used as a development tool. For the present, there is no plan to build a nuclear device. The efforts of the armed forces are limited to purely peaceful lines of action

which, as a matter of fact, represent a much greater technological challenge than the mere building of a bomb," Gen Guimaraes said.

According to the spokesman, "The technology needed for the building of nuclear bombs is practically in the public domain. All you need to make an atomic bomb is a sphere composed of a kilogram of plutonium, perforated in the center, and a 500-gram rod to make the critical mass. To build a reactor, we need to find out the resistance of various materials that function at high temperature. We need to control the atom. This interests us. It is a much more interesting challenge."

In the opinion of Gen Guimaraes, this position does not preclude the existence of the atomic bomb as an instrument of peace. He recalled that "Minister Pires always says that the Hiroshima bomb did more for peace than Picasso's dove. After Hiroshima and Nagasaki we had 43 years of peace, something unheard of in the history of the world. If you read 'Perestroika,' the book by Soviet leader Mikhail Gorbachev, you will be even more convinced of the existence of the bomb as an instrument of peace. Thanks to it, we are arriving at a global understanding that may perhaps enable us to end confrontations. The bomb has made world war inconceivable."

According to the spokesman, Brazil's position in favor of the peaceful use of the atom must be made very clear. "We do not want to shoulder the burden of being the first nuclear power in Latin America," Gen Guimaraes stated.

12830

Constituent Assembly Approves Text Governing Nuclear Activities

51002018a Rio de Janeiro O GLOBO in Portuguese
8 Mar 88 p 6

[Text] Brasilia—The text approved yesterday by the National Constituent Assembly, meeting in plenary session, is as follows:

Title III

The Organization of the State

Chapter II

The Federal Government

Article 22 The following are included among the assets of the Federal Government:

- VII. Potential sources of hydroelectric energy;
- VIII. Mineral resources, including those in the subsoil;
- IX. Natural subterranean cavities of scientific or scenic interest, as well as archaeological and prehistoric sites;

X. Lands occupied by the Indians on a permanent basis;

XI. Assets which now belong to it or which may be attributed to it.

Section 1. The States, the Federal District, the Municipalities and the entities directly administered by the Federal Government are assured financial compensation or a share in the proceeds from the exploitation of water resources used to generate electrical energy, and from exploitation of petroleum or natural gas and other mineral resources within their territories, as well as on the continental shelf, the territorial sea, and the exclusive economic zones thereof.

Section 2. Inasmuch as the strip of land, up to 150 kilometers wide, which lies just inside the land frontiers and is designated as the frontier strip, is considered fundamental to the defense of the national territory, its occupation and utilization shall be regulated by law.

Article 23. The following are prerogatives of the Federal Government:

- I. To maintain relations with foreign States and to participate in international organizations;
- II. To declare war and make peace;
- III. To provide for the national defense;
- IV. To permit, in cases provided for in complementary law, foreign forces to transit through the national territory or to remain therein temporarily;
- V. To decree a state of siege, or state of defense, and federal intervention;
- VI. To authorize and supervise the production and trade in war materiel;
- VIII. [as published] To administer the country's foreign exchange reserves and to audit transactions of a financial nature, especially credit, exchange, and capitalization transactions, as well as insurance and private pension and disability plans;
- IX. To draft and implement national and regional plans for organizing the territory and for economic and social development, as approved by the National Congress;
- X. To maintain the postal service and domestic air mail system;
- XI. To exploit—directly or through assignment to companies whose ownership is controlled by the government—the telephone, telegraph, data transmission and other public telecommunications services. The provision of information services by an entity operating under private law via the public telecommunications network operated by the Federal Government is assured;

XII. To operate the following, directly or via authorization, concession, or permit:

(a) Broadcasting of sound, sound and images, and other telecommunications services;

(b) Electrical energy services and facilities, and the exploitation of the energy of waterways in conjunction with the States where such potential sources of hydroelectric energy are located;

(c) Air and aerospace navigation, and the airport infrastructure;

(d) Railway and waterway transportation services between Brazilian ports and the national frontiers, or when such services cross the boundaries of a State or territory;

(e) Maritime, river, and lake ports;

XII. [as published] To organize and maintain the Judicial Branch, the Office of the Public Attorney, and the Office of Public Defender of the Federal District and of the Territories;

XIII. To organize and maintain the federal police and the federal highway and railway police, as well as the civilian police force, the military police, and the military fire departments of the Federal District and the Territories;

XIV. To organize and maintain the official statistical, geographical, geological, and cartographic services at the national level;

XV. To classify public entertainments and telecommunications programs, for indicative purposes;

XVI. To grant amnesty;

XVII. To plan and arrange for continuous defense against civil disasters, especially droughts and floods;

XVIII. To institute a national water resources management system and define criteria for awarding rights to use them;

XIX. To institute directives for urban development, including housing, basic sanitation, and urban transportation;

XX. To establish the principles and directives for the national transportation and highway systems;

XXI. To operate the maritime, air, and border police services;

XXII. To exploit the services of nuclear facilities, regardless of type, and to exercise a government monopoly over the prospecting, mining, the enrichment and reprocessing, industrial use, and the sale of nuclear ores and their by-products, observing the following requirements:

(a) Any nuclear activities within the national territory will only be permitted if for peaceful purposes and if approved by the National Congress.

(b) The use of radioisotopes, under a concession or permit system, is authorized for research and for medicinal, agricultural, industrial uses and analogous activities.

(c) Civil liability for nuclear damages does not depend on the presence of fault.

XXIII. To organize, maintain, and implement inspection in the labor sphere, as may be provided in law;

XXIV. To establish the area and the conditions for placer mining by associations.

Article 24. The Federal Government has sole authority to legislate on the following subjects:

I. Civil, commercial, criminal, procedural, electoral, agrarian and labor law;

II. Maritime, aviation, and space law;

III. Expropriation;

IV. Civil and military regulations in cases of imminent danger and in time of war;

V. Water, telecommunications, radio broadcasting, electronic data processing, and energy;

VI. The postal service;

VII. The monetary system and the system of measures, negotiable instruments, and the guaranteeing of bullion;

VIII. Policy regarding credit, exchange, and insurance and the transfer of valuables in foreign and interstate commerce;

IX. Directives of national transportation policy;

X. The port system, and lake, river, maritime, air, and aerospace navigation;

XI. Traffic, transportation of goods and persons on federal highways and railroads, and public traffic safety education;

XII. Deposits, mines, and other mineral and metallurgical resources;

XIII. Nationality, citizenship, and naturalization;

XIV. Indigenous peoples;

XV. Emigration, immigration, and the entry, extradition, and deportation of foreigners;

XVI. Organization of the national employment system, and conditions for engaging in certain occupations;

XVII. Organization of the judiciary, of the Office of Government Attorney and the Office of the Public Defender of the Federal District and the territories, including the administrative structure thereof;

XVIII. The statistical, cartographic, and national geological systems;

XIX. Savings, consortia, and lottery systems;

XX. General standards for organization, troops, war materiel, and assurance of the existence of military police and military fire departments, as well as rules for their conscription and mobilization;

XXI. The jurisdiction of the Federal Police, highway police, and railway police;

XXII. Social security;

XXIII. Directives and foundations for the nation's educational system;

XXIV. Public recording of documents and vital statistics;

XXV. Nuclear activities of any kind;

XXVI. General rules on all forms of bidding and contracting for the public administration, both direct and indirect, at the three levels of government as well as for the foundations and enterprises under the control thereof;

XXVII. Territorial defense, aerospace defense, civil defense, and national mobilization;

Sole Paragraph: Complementary law may authorize the States to legislate on specific issues within the topics listed in this Article.

Cooperation With Argentina Discussed at March Meeting

51002018c Sao Paulo GAZETA MERCANTIL in Portuguese 2 Mar 88 p 12

[Report by Cristina Borges]

[Text] Self-sufficiency in the area of nuclear energy is the primary objective of Brazil and Argentina under the mutual cooperation agreement signed by Presidents Jose Sarney and Raul Alfonsin at Iguazu Falls in 1985. Nuclear safety, the development of more advanced reactors, the exchange of nuclear equipment, and pacts between universities and nuclear physics research centers were among the topics discussed at the sixth round of negotiations between Rex Nazare and Emma Perez Ferreira, respectively the chairpersons of the nuclear energy commissions of the two countries—Brazil's CNEN and Argentina's CEA. The meetings ended yesterday.

The new programs agreed upon will serve as a basis for the drafting of the agenda for a meeting between Alfonsin and Sarney in Brasilia at the end of this month, at which new agreements will be signed. Nazare acknowledged that the Argentine nuclear program is more advanced than the Brazilian one and attributed that country's progress to the centralization of activities, which in Brazil, are distributed among Nuclebras, Furnas, and the CNEN.

One of the advantages of the nuclear partnership with Argentina, Nazare stressed, is that both countries will be able to progress without submitting themselves to the pressures from the Club of London. That group, led by the United States and the Soviet Union, is made up of the industrialized nations who have achieved nuclear technology. "The Club is the oligopoly which sets the rules that block the entry of new members," the CNEN chairman said.

Ms Perez announced that Argentina is conducting a research study, costing in the neighborhood of \$300 to \$400 million, aimed at creating a safer storage facility for atomic waste. At present, highly radioactive refuse left over after the uranium is used by the nuclear plants is deposited in structures that resemble swimming pools, located near the plants. The new project involves processing highly radioactive waste in its liquid form, vitrifying it, and then placing it in containers made of lead and steel that would then be stored in subterranean cavities carved out of granite.

Next June, Brazil will send Argentina 10 hollow cathode tubes to be placed in the atomic absorption spectrophotometers (equipment used for chemical analysis) which Argentina makes. Yesterday, Brazilian and Argentine businessmen submitted to the CNEN and CEA a proposal for the identification of complementary equipment manufactured by the two nations, for purposes of future exchanges worth \$10 million on each side.

The Argentine nuclear program has been in existence for 37 years, Ms Perez reported. Construction of the Atucha I and Embalse nuclear power plants (the former 100 km from Buenos Aires, the latter in Cordoba Province) cost \$8 billion. Both are operating and account for 14 percent of the electricity supply. Consumer expenditure on that electrical energy is equivalent to half the average value of the electricity produced by other sources, the CEA chairperson said.

12830

Navy To Respond to Public Queries on Aramar Facility

51002018d Sao Paulo O ESTADO DE SAO PAULO in Portuguese 6 Mar 88 p 7

[Report by Jose Maria Tomazela]

[Text] The Navy has decided to break the silence that has been surrounding the Aramar Project now under way in the municipality of Ipero, near Sorocaba, and involving the enrichment of uranium under the parallel nuclear program. The Office of the Coordinator for Special Projects (Copesp), an agency connected with the Navy and responsible for setting up the Aramar Experimental Center, announced yesterday the opening of a channel of direct communication between its technicians and the community. All anyone interested in having information on the project needs to do is write to Copesp Aramar, Post Office Box 46, Ipero, and clearly state his or her

questions. According to the Navy, the letters will be answered prepared by technical staff who are working on the project and the responses mailed to the sender as soon as possible.

According to the chairman of Copesp, Rear Adm Othon Luis Pinheiro da Silva, this is one of the ways in which the Navy will attempt to explain the true purposes of the Aramar Experimental Center to the public, so as to erase the prejudices present in some parts of the community. "We cannot look at the Aramar Experimental Center only in terms of the building of a nuclear reactor to propel submarines and surface vessels. It is actually a comprehensive program of research and development that will train us in several areas of human knowledge and have important repercussions in such areas as health, industry, and agriculture."

The official justified the secrecy concerning the project, claiming that "no country in the world gives another country information on how to overcome technical difficulties in order to master nuclear technology. If what we were doing were publicized, we would encounter even greater difficulties in acquiring equipment and materials from sources outside Brazil."

The Aramar Experimental Center will be visited later this month by Presidents Jose Sarney of Brazil, Julio Maria Sanguinetti of Uruguay, and Raul Alfonsin, of Argentina. The official inauguration of the process for enriching uranium using an ultracentrifuge will take place during that visit.

12830

INDIA

Government To Buy 2 Nuclear Reactors From USSR

BK010728 Hong Kong AFP in English
0720 GMT 1 Apr 88

[Text] New Delhi, April 1 (AFP)—India will buy two 1,000-megawatt nuclear reactors from the Soviet Union under an agreement expected to be signed by the end of April, a newspaper said here Friday.

M.R. Srinivasan, chairman of India's Atomic Energy Commission, will leave for Moscow Saturday (2 April) to hold a final round of talks with Soviet officials ahead of signing an agreement, THE HINDU reported from Bombay.

Under the agreement, the Soviet Union would ensure regular supplies of enriched uranium and take back used fuel in a bid to avoid controversies over international safeguards, the daily said. No cost was mentioned.

Officials were not available here Good Friday, a public holiday, to confirm the report, which was unsourced.

India is not a signatory of the Nuclear Non-Proliferation Treaty, which it says discriminates against developing countries.

Some observers have said imported nuclear reactors could be open to international inspection.

New Delhi has said previously that it was considering a Soviet offer to sell it nuclear reactors, first made in 1979. The 1986 Chernobyl disaster sparked off opposition to Soviet nuclear technology.

India's nuclear programme, which aims at raising nuclear power generation ten-fold to 10,000 megawatts by the turn of the century, is mostly indigenous with imports restricted to raw materials and special components.

India Has 'Sovereign Rights' Over Soviet Nuclear Submarine

51500134 Bombay THE TIMES OF INDIA in English
20 Feb 88 p 1

[Text] New Delhi, 19 February—India has sovereign rights over the Soviet nuclear-powered submarine, taken on a 3-year lease, and it can deploy it for an operational role in the event of any hostilities. Authoritative Soviet sources clarified this in response to questions, but declined to specify the class of the submarine. They would not comment on conflicting reports from Western sources, some saying that it is an obsolete vessel and others describing it as an advanced one of "Charlie" class. The Soviet Union has no reservation about India's Light Combat Aircraft (LCA) programme and considers it normal that India should approach the U.S. for some

elements of technology for this advanced aircraft. A proposal for the manufacture of the latest Soviet MiG-29 in India is being considered, but no decision has been taken as yet. These points relevant to the Indo-Soviet relations in the defence field, emerged from a press conference addressed by the Soviet military attache here, Maj-Gen I. Golovanov, today. It is the first-ever such event organised by the Soviet information service. Maj-Gen Golovanov first made a statement to mark the 70th anniversary of the Soviet armed forces and then went on to tackle effortlessly questions, some of which would have, in an earlier era, turned the face of the speaker red. In reply to a question, the Soviet military attache said there was no incompatibility between the Soviet non-proliferation objectives and the supply of the nuclear-powered submarine to India. The vessel was not equipped with nuclear weapons. In a lighter vein, he said the time might come when cars and bicycles could also be nuclear-powered. It would be the main source of energy in the future. Asked what would happen after the 3-year lease was over, he said this vessel was mainly for training purposes and it was expected that India would have an indigenous alternative. When his attention was drawn to the fact that the Soviet Union had not shown any enthusiasm for the LCA project even though it promoted self reliance, he said India was the best judge. But his own opinion was that there should a single-role aircraft rather than combining the interceptor-bomber roles into one machine. However, he appreciated India's desire to build its LCA and also its requests to the West for some elements of technology. In the integrated world of today, it was quite understandable, the Soviet Union would be prepared to get any Indian technology that it found suitable, he said.

/12232

Minister Says No Nuclear Arms on Visiting Ships

51500133 Bombay THE TIMES OF INDIA in English
25 Feb 88 p 3

[Text] New Delhi, 24 February—The ships that came on goodwill visits to India did not carry any nuclear weapons, Mr Natwar Singh, minister of state for external affairs, told the Lok Sabha today.

He told Mr Subhash Yadav that all countries whose ships were intending to visit India were given a proforma to fill. The proforma also carried Indian policy as well as the UN resolution of 1971 which said that the Indian Ocean was a zone of peace.

He, however, assured the member that there was no doubt that ships on goodwill visit had not carried any nuclear weapon.

The member also wanted to know if it were true that Pakistan had extended facilities to U.S. ships, Mr Singh said that some U.S. ships had visited Pakistan since the two countries had an understanding on defence matters.

Mr Singh also said that no ship had entered India's economic zone without permission.

Mr Singh told Mr Indrajit Gupta and others in a written reply that the government deeply regretted that another waiver has been granted to Pakistan from U.S. non-proliferation laws despite mounting evidence of the non-peaceful dimensions of its nuclear programme. The government was also seriously concerned about the negative implications of these developments for global non-proliferation efforts.

The defence minister, Mr K.C. Pant, told Mr Vishnu Modi that the Indian view about the acquisition by Pakistan of weapons far beyond legitimate defence requirements had been conveyed to all concerned from time to time.

The member had drawn the minister's attention to Pakistan buying copters for Siachin area. Mr Pant further said that India watched all developments having a bearing on the country's security. But no protest had been lodged in connection with the acquisition of the copters.

He told the member that Indian soldiers had fought valiantly and repulsed two Pakistani attacks in September and October last year.

On a military-to-military basis Pakistan had been informed that India wanted peace when large concentration of troops was noticed on the border. "We did not want an adventure. But the attacks came despite it."

/12232

Soviet Nuclear Plant Likely for Tirunelveli
51500135 Madras THE HINDU in English
16 Feb 88 p 1

[Text] New Delhi, 15 February—the first nuclear power plant to be obtained from the USSR is likely to be set up in Tirunelveli. Official sources say that while the discussions with the Soviet Union are still in progress, they are likely to be completed soon since the Soviets have met most of the Indian conditions relating to the setting up of such plants based on the VVER-440 Light Water Reactor technology using enriched uranium. The Tirunelveli plant is likely to have two units of 440 MW each based on this proven Soviet technology which has been doing well not only in the Soviet Union but also in countries like Finland and several East European nations.

The Soviet VVER-440 reactors are to be differentiated from the 1000 MW RBMK Channel-type light-water cooled graphite moderated reactors like the one involved in the accident at Chernobyl. The VVER-440 reactors are considered very reliable and have a consistently high load factor. Unlike the RBMK, they are of a standard LWR design and the Soviet experience as well as that of Finland have resulted in several modifications that have

enhanced the safety standards as well. The VVER-440 has since been upgraded to the 1000 MW design but India has made it clear that its requirements would be best met by reactors of the 440 MW size.

The Crucial Issue

The crucial issue relating to the import of Soviet reactors has been related to the safe-guards regime which the Soviet Union as a signatory to the NPT-determined non-proliferation regime would be insisting on. While it is believed that the Soviets are prepared to take back the spent fuel, some other issues relating to the IAEA safe-guards have to be ironed out. From the Indian point of view that is shaped by the Tarapur experience, there has been a clear perspective that the Soviet Union is a reliable supplier of sensitive nuclear material. It is learnt that the Soviets have provided adequate guarantees on this score, and one method is to provide a 'bunching' of fuel supplies to prevent a Tarapur-type situation.

Problem of Safeguards

The second issue is of course the problem of safeguards (as per the supplier's specific commitment to the International Atomic Energy Agency) may 'creep' on to the rest of the Indian programme. But since it is reliably learnt that the Soviets are willing to take back all the spent fuel (unlike the United States in the case of Tarapur) difficult problems of controversies should not arise and the Soviet plants will be 'islanded out' of the rest of the Indian nuclear programme.

Under Discussion for Some Time

The discussion on the supply of Soviet nuclear reactors has been going on for quite some time now. Earlier, aside from the issues relating to safeguards, there was a feeling in some influential circles in the Department of Atomic Energy that the import of Soviet technology would have a dampening impact on the domestic nuclear power programme. These feelings have now changed—certainly at the top—and there is confidence that there will be no such negative outcome unless the idea is to find scapegoats.

The primary compulsion for the import of the Soviet reactor lies in the clear awareness that the DAE will not—through the planned route—be able to meet the target of 10,000 MW of installed nuclear power capacity by the turn of the century. Given the enormous 'energy gap' emerging, the government has chosen to make substantive adjustments in the path opted for. The induction of Soviet reactors of a tried and tested design which will go on stream without teething troubles is obviously advantageous. The soft terms of credit expected to back up the not inexpensive project will be another significant attraction.

/12232

Madras Atomic Station Reopens After 4 Months
BK120326 Delhi Domestic Service in English
0240 GMT 12 Apr 88

[Text] The 235-megawatt second unit of the Madras atomic power station at Kalpakkam has been synchronized with the Tamil Nadu grid after a 4-month shutdown. The unit was closed for inspection of the underground tunnel bringing the sea water to the cooling system and also for correcting vibration problems.

PAKISTAN

Prime Minister Opposes Regional Nuclear Arms
BK050351 Islamabad Domestic Service in English
1600 GMT 4 Apr 88

[Hussein Aqani commentary]

[Text] Prime Minister Mohammad Khan Junejo has reiterated Pakistan's desire to make the South Asian region a nuclear free zone of peace. Addressing the inaugural session of the 14th International Conference on Solid State Nuclear Track Detectors, the prime minister said he would like to go along with the global trend to banish nuclear options for destruction and added that the balance in regional politics should be based on hope and confidence rather than on threats of terror. Pakistan has consistently opposed the prospective introduction of nuclear weapons in its region.

South Asia faces serious problems of poverty and deprivation which need the attention of the region's governments. With scarce resources, countries in this area cannot afford to embark on an arms race, especially one involving weapons of mass destruction. But for it to be effective, the commitment to banish nuclear weapons should come from all nations in the region. Nuclear energy should be harnessed for peaceful and productive purposes as Pakistan wishes to do and has been doing. It is ready to join any regimen for nonproliferation of nuclear weapons which precludes the use of nuclear technology for nonpeaceful purposes by itself and its neighbors.

Unfortunately, one of Pakistan's neighbors does not tactically recognize the need for nonproliferation arrangement based on equality and mutuality. The prime minister's reiteration of Pakistan's stance against nuclear weapons has come amidst reports that its large-sized Asian neighbor is acquiring nuclear powered submarines and has already developed several atom bombs. These reports have certainly caused the concern and do not augur well for the future of the region as a nuclear weapons free zone. Elimination of weapons of mass destruction is the desire of all humanity and should be made part of all governments' policy. Pakistan is proud

of supporting the cause for a nuclear arms free neighborhood, and other countries in the region, too, should join in ending the mad surge for domination and accepting to devote their energies for the development of their people in an atmosphere of peace.

Alleged Indian Plans To Attack Kahuta Reiterated
46560022a Karachi JANG in Urdu 6 Feb 88 p 3

[Editorial: Kahuta Nuclear Plant and Our Responsibility]

[Text] In view of the skepticism expressed by the United States, India, and Israel concerning nuclear preparations made by Pakistan in reference to the nuclear plant at Kahuta, the apprehension that our open enemies and false friends would try to block our advancement in the field of technology entirely by our own efforts, technical expertise, and resources has become a stark reality. The Indian and Jewish lobbies are actively against our nuclear advancement. A former Israeli military intelligence chief told an Indian journalist, Mr Bharat Karnao, who resides in the United States, that Israel has made several offers to India to take commando action against the Kahuta nuclear plant, which included the assassination of a key Pakistani personality. According to Mr Bharat Karnao's article published in the Indian newspaper, SUNDAY TIMES, India is capable of taking its own commando action against the Kahuta plant, or would with the assistance of Israel, or with the collaboration of Afghanistan. It is in the interest of India and the Soviet Union to reduce Pakistan's military strength by destroying its nuclear program. The report goes on to say that India would have to sacrifice four planes only. India would use Jaguar planes and MIG-29 escort planes for the mission. The attack would be so sudden and unexpected that Pakistan would neither be able to defend itself nor would the United States come to its assistance. According to this report, the activities of the Indian army in Siachen may be the staging point for the commando action.

No non-Muslim country, including the Soviet Union and the United States, wants any Muslim country to have access to modern technology. Muslim access to this technology would mean that the monopoly of the super powers would come to an end and Muslim countries would be able to use modern technology for both development and military purposes. This explains why Israel destroyed the nuclear centers in Iraq and why the Soviet representative in the United Nations congratulated Israel even though Iraq and the Soviet Union have been allies in the past. This is also the case for Pakistan. Despite repeated assurances given by Pakistani rulers, the United States is not prepared to believe our statements. Almost every day there is propaganda against Pakistan's nuclear preparations in the United States; because of these allegations and despite an agreement with Pakistan, economic and military aid remained suspended for several months. Observers of international atomic energy agencies have testified in reports

submitted after visiting Pakistan's nuclear establishments on dozens of occasions that they did not find any indications which could prove that Pakistan was engaged in the manufacture of nuclear weapons. In sharp contrast to this, India, which neither permitted its nuclear installations to be inspected nor signed the atomic proliferation accord, will be receiving sophisticated computers from the United States which help in the manufacture of atomic weapons. The Soviet Union has already provided India with nuclear powered submarines. The actions taken by both the Soviet Union and the United States prove that they do not wish to see any Muslim country making progress in the field of nuclear technology. The above-mentioned report, stated that according to the British newspaper, STREET JOURNAL, the United States Government is seriously considering an attack on Kahuta.

During the last days of the Indian ruler, Indira Gandhi, the possibility of an Indian attack on Pakistan was expressed with great vehemence. According to some international news sources, India attempted to stage an air attack on Kahuta but they were defeated by the Pakistani air force. Some international news sources said that if Mrs Gandhi had lived a few months more, she would have decided to attack Pakistan making war between the two countries inevitable. Currently clashes between Pakistan and India over the Siachen glacier are continuing and according to one report it is believed that military activities of the Siachen glacier will prove to be the beginning of commando action. Keeping in mind the upheaval raised over Pakistan's nuclear program, the anguish and criticism expressed by India, Israel, and the United States against the nuclear program, any action is possible. Pakistan should always be prepared for any action. There is no doubt that geographically the location of Kahuta is quite secure; despite the precautionary measures taken by the government for the safety of its nuclear installations, and its determination to teach the aggressors a lesson, it is the duty of the government to be fully prepared for every expected and unexpected situation. The Kahuta nuclear plant is the product of our own resources and the efforts of our scientists and engineers. It is a matter of life or death for us and, therefore, it must be protected from every potential danger.

9315/9738

Existence of Enrichment Plant Denied

SI/04722 Surrey NUCLEAR ENGINEERING in English Feb 88 p 7

[Article: "Pakistan Denies New Enrichment Plant"]

[Text] A report that Pakistan is building a second uranium enrichment facility at Golra Sharif, six miles west of Islamabad has been denied by Pakistan. Dr Abdul Qadeer Khan head of the existing Kahuta enrichment facility, denied that there is such a plant at Golra. The FINANCIAL TIMES carried the report, which originated in the United States on 11 December.

The plant is not yet thought to be operational. However, US satellites have apparently watched its construction over several months. A thick concrete floor was laid to act as a stable base for the centrifuges. The report says that a centrifuge hall has now been assembled, but Western diplomats believe the several thousand centrifuges required have not yet been installed.

There are two centrifuge halls at Kahuta, 20 miles south-east of Islamabad. One is equipped with aluminum centrifuges, and the other with centrifuges made from toughened maraging steel. The Golra plant is expected to be equipped with maraging steel centrifuges, the report says.

The Pakistanis claim that the purpose of the Kahuta plant is to enrich to 5 per cent for civil power reactors, although Pakistan only has one power reactor and this uses natural uranium fuel. It is thought that Pakistan has enriched uranium to 90 per cent, sufficient for nuclear weapons, at Kahuta.

The reason for building a second plant could be to spread out the facilities which might be exposed to Indian attack, the report says. It might also enable Kahuta to limit itself to 5 per cent enrichment and to be opened to international inspection.

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TURKEY

Tea Drinker Has 4,693 Becquerel Count in Radioactivity Test

51002443 Istanbul CUMHURIYET in Turkish
29 Jan 88 p 9

[Commentary by Ahmet Tan "Off the Top of the Day":
"Excessive Radiation in SHP Member: An Interview
With Irradiated Deputy"]

[Text] Social Democratic People's Party [SHP] deputy, Ayhan Arif Agaoglu, is a tea drinker from Artvin. If you start with a man like Agaoglu, who is from Artvin, and add to that his habit of overdoing things and of tea drinking, you get a man with a body full of radiation.

It was Hatice Ozer of the newspaper MILLIYET who had the idea of getting the amount of absorbed radiation in Agaoglu's body measured. According to the tests conducted at the Ankara Nuclear Research Center, 4,693 becquerels of radioactivity were found in his body. A measurement of the radiation by identical means in "an ordinary Ankara resident," photo-reporter Yavuz Yukse, came to 687 becquerels.

SHP Deputy Agaoglu's friends joke with him and say, "Now don't get too close to us." Though doctors say that this amount of radiation is still far from the critical level, nonetheless, our co-worker Hakan Aygun felt it was safer to contact the "radiation-contaminated" deputy by phone:

"Doesn't the fact that you're carrying around this much radiation make you feel odd somehow?"

"No, I'm only annoyed. And that's not because of the radiation, but because of the officials who say that the radiation is harmless. If it was harmless, then why are they looking for a place to bury that tea?"

"Plans are afoot, I think, for burying the tea in your election district."

"Yes. But it is difficult to find a spot, because Artvin's all mountain and rock. You have to have land to bury something. Where on earth is there any land in Artvin?"

"Did you know anything about radiation?"

"No. I used to know a little physics and chemistry at one time, but that's all. I'm a jurist. That's how we met up with each other. They say it's all because I drink tea all the time; but, since I live in Artvin and that damned stuff rained on our hills in any case, it wouldn't matter if I were a tea drinker or not."

"If any harm comes to you from this, what will you do?"

"As a deputy, we have no choice but to propose an open hearing on the subject."

In our opinion, "the irradiated deputy" should not waste time with holding hearings or such things. If he wants to redress the becquerels in his body and, more important, if he wants to right the wrongs done to the orphans exposed to radiation but whose situation is not yet hopeless, he should hug and kiss Cahit Azal whenever and wherever he sees him; in fact, he should find a way to hold greased wrestling matches in the Motherland Party lobby.

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